On investigating the ...

above for various values of μ, e, c, F (F is the force exerted by the piston on the case due to a spiral spring of rigidity k). The amplitude of the case is measured with a microscope, and the nature of the impact is determined with an oscillograph. Results show that an increase in F leads to a system with several impacts per oscillation. The least resonance amplitude arises in the case of a single-impact system, which occurs for small f. Increase of the rigidity of k increases the resonance amplitude. In the case of small μ, the damper has greater practical significance. A graph is given of amplitude/frequency of the system for $\mu' = 0.1$, e = 0.04 mm, c = 38.2 kg/cm, k = 0.75 kg/cm. f_0 the basic resonance, is the resonance of oscillations without impact. A graph is also given for the case of dynamic damping. It may be observed that the experimental and theoretical results for the resonance amplitude agree well. There are 5 figures, 1 table and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: G. Grubin, On the theory of the Acceleration Damper, J. of Appl. Mech., v. 23, n. 3, Sept. 1956.

Card 5/6

25108

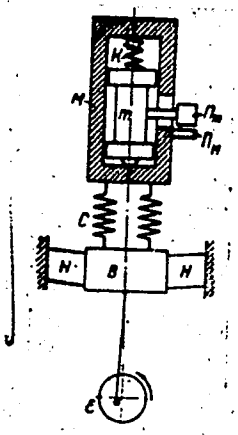
S/198/61/007/003/003/013
D264/D303

On investigating the ...

ASSOCIATION: Instytut mekhaniki AN URSR (Institute of Mechanics, AS UkrSSR)

SUBMITTED: April 12, 1960

Fig. 1.



Card 6/6

GALAKA, P.I. [Halaka, P.I.] (Kiyev); BONDARENKO, A.A. (Kiyev)

Dissipation properties of plastics. Prykl.mekh. 7 no.4:451-454 '61. (MIRA 14:9)

1. Institut mekhaniki AN USSR.
(Plastics—Vibration)

GAL'KA, [illegible] (Kiyev) [illegible], A.A. (Kiyev)
[illegible], A.I. (Kiyev)

Some dynamic properties of glass-reinforced plastics at high temperatures. Prykl. mekh. 10 no.5:565-567 '64.
(MIRA 17:10)

1. Institut mekhaniki AN Ukrainy.

GALAKA, P.I. [Halaka, P.I.]; BONDARENKO, A.A.; TELALOV, A.I.

Damping properties of vitreoplastics at elevated temperatures.
Dop. AN URSR no.3:300-302 '65. (MIRA 18:3)

1. Institut mekhaniki AN UkrSSR.

SELEZNEVA, A.A.; GALAKHAR', N.L.; BUDAZHAPOVA, N.A.

Hemagglutination inhibition reaction with serums f people and domestic animals from the Tomsk focus of tick-borne encephalitis. Trudy TomNIIVS 14:22-23 '63. (MIRA 17:7)

1. Kafedra mikrobiologii Tomskogo meditsinskogo instituta i Tomskiy nauchno-issledovatel'skiy institut vaktsin i syvorotok.

GALAKHIN, A.

Meeting of experimental apiculturists. Pchelovodstvo 29, no 6, 1952.

GALAKHIN, Aleksandr Ivanovich; GLIKMAN, N., red.; ISUPOVA, N., tekhn. red.

[Backyard apiary] Priusadebnaia paseka. Simferopol', Krym-izdat, 1960. 106 p. (MIRA 15:3)
(Bee culture)

KLYUCHEROV, A.P.; KONDRAT'YEV, S.N.; Prinimali uchastiye: GUSAROV, F.V.; UDOVENKO, V.G.; PETROV, G.A.; BURKSER, V.Ye.; SHMONIN, I.A.; KUDRIN, Ye.A.; GALAKHMATOV, S.N.; ZIMINA, L.P.; SHISHARIN, B.N.; KONDYURINA, R.V.; BURMISTROV, K.A.; SHIRNIN, I.A.; SIMONENKO, F.N.; GORSHILOV, Yu.V.; KOLPAKOV, B.V.; GUSAROV, A.K.; BOLOTOV, P.G.

Heat insulation of open-hearth furnace crowns. Metallurg 5 no.11: 14-17 N '60. (MIRA 13:10)

1. Nizhe-Tagil'skiy metallurgicheskiy kombinat.
(Open-hearth furnaces--Design and construction)
(Insulation (Heat))

GALAKHOV, A.

Scientific and technical conference of workers of automotive organizations. Avt.transp.34 no.5:35 My '56. (MLRA 9:9)
(Amur Province--Transport workers--Congresses)

GALAKHOV, A.

On good and bad managers. Avt.transp.33 no.9:9 S'55. (MLRA 8:12)

1. Nachal'nik Gosavtoinspektsii Amurskoy oblasti
(Transportation, Automotive)

GALAKHOV, A. (Blagoveshchensk); ZIMIN, N. (Blagoveshchensk)

More on the training of automobile drivers. Za rul. 21 no.1:21 Ja '63. (MIRA 16:1)

1. Nachal'nik Gosudarstvennoy avtoinspektsii Amurskogo oblastnogo ispolnitel'nogo komiteta (for Galakhov).
(Automobile drivers—Education and training)

SKUCHILIN, Yu.A.; GALAKHOV, A.D.

Press with a 630-ton lower drive. Kuz.-shtam.proizv. 1 no.12: 43-44 D '59. (MIRA 13:4)
(Power presses)

GALAKHOV, Aleksandr Vasil'yevich; VOROB'YEVA, O.A., doktor geol.-mineral. nauk, otv.red.; ARON, G.M., red.izd-va; BLEYKH, E.Yu., tekhn.red.

[Rischorrites in the Khibiny alkali massif] Rischorrity Khibinskogo shchelochnogo massiva. Moskva, Izd-vo Akad.nauk SSSR, 1959. 169 p. (MIRA 13:5)
(Khibiny Mountains--Nepheline syenite)

GALAKHOV, A. V.

33921. Obyekchti I Kuri Svumchorrskogo Myestorozhdyenya Apatita V Khibinskikh Tundrakh. Sbornik Nauch. Rabot Studyentov Karyelo-Fin. Gos. Un-ta VYP 1, 1948, C 75-81/

SO: Letopis' Zhurnal'nykh Statey, Vol. 46, Moskva, 1949.

GALAKHOV, A. V.

PA 11/49T48

USSR/Geology Jul 48
Stratification
Petrology

"Problem of the Age of the Keyv Strata," A. V. Galakhov, Kola Sci Res Base, Acad Sci USSR, 2 pp

"Dok Ak Nauk SSSR" Vol LXI, No 3

Discusses available evidence of the age of the Keyv Strata in Kola peninsula. Concludes that it is probably Pre-Cambrian. Submitted 19 May 48.

11/49T48

GALAKHOV, A.V.

20-1-44/54

AUTHOR SIDORENKO A.V., corresponding member of the Academy, and GALAKHOV A.V.

TITLE Pre-glacial Continental Deposits in Khibiny, and certain Problems of Palaeogeography.
(Doledníkovyye kontinental'nyye otlozheniya v Khibinakh i nekotoryye voprosy paleogeografii.- Russian)

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 115, Nr 1, pp 161-163 (USSR)

ABSTRACT The palaeogeography of the Kola Peninsula has hardly been investigated at all from the upper Palaeozoic to the Quarternary. A long-lasting continental regime not only destroyed the major part of older deposits on the continent, but it also denuded the deepest horizons of the earth's crust. Therefore the finds of geological formations of the preglacial time are of considerable importance. In recent years data were published on extensive developments of preglacial formations in this region in form of a crust of weathered material. It has already been said earlier that some old boulders occur in Khibiny. This is true. Old deposits in the Poachvum valley are described as a characteristic. Cemented breccia quite frequently occurs here. On the

CARD 1/4

Pre-glacial Continental Deposits in Khibiny, and certain Problems of Palaeogeography.

borders of the valley they rise upt to 25-30 meters. This indicates a considerable thickness of deposits. They are covered by a moraine with a distinct contact- The breccia consists of bits of local rocks. A comparative recency of the splinters was noticed. Much weathered bits occur rarely and belong to nephelite. The conditions of sedimentation, the structure of deposits, the form and the petrographic composition of the splinters indicate that old preglacial and diluvium boulders occur in the Khibiny valleys. They usually did not undergo any considerable displacement, sorting out, and rolling. The author asks himself whether these described formations do not represent an old moraine which was better cemented than the younger one covering it. Such an assumption is justified, since two morains manifest themselves in the Khibiny. Marked differences exist between preglacial continental deposits and quarternary glacial deposits. The discovery of diluvium and old boulders is the first on Kola and is very interesting since it casts some light on the preglacial history of the Khibiny. It indicates that the basic elements of the Khibiny relief were laid already in the

Pre-glacial Continental Deposits in Khibiny- and certain Problems of Palaeogeography.

preglacial period. At least at the time of glaciation comparatively high mountains existed in Khibiny as well marked valleys with large boulders, and here and there deposits of temporary broocks. The accumulation of the old deposits of the valleys lasted apparently for a long time. This fact promoted their consolidation and cementation, whereas the recent boulders are loose. No sedimentary deposits of this solidity are known among glacial and postglacial continental formations. The comparative recency of the splinters and an extremely small content of clay particles indicates that mainly physical processes participated in their formation. Only the nephelite grains were subject to chemical weathering which gave an opal cement. The conservation of the diluvium in the valleys where the glacier erosion was strongest requires a revision of the current opinion according to which there was considerable glacier erosion in Kola. It would be especially

20-1-44/54

Pre-glacial Continental-Deposits in Khibiny, and certain Problems of Palaeogeography.

promising to search for preglacial deposits in the east of the peninsula where glacier activity was insignificant.
(2 Tables, 4 Slavic references)

ASSOCIATION: Kola branch S.M. Kirov of the Academy of Sciences of the USSR.
(Kol'skiy filial im. S.M. Kirova Akademii nauk SSSR)

PRESENTED BY: -
SUBMITTED: 20.2.57
AVAILABLE: Library of Congress.

CARD 4/4

GALAKHOV, A.V.

Lovchorrite-bearing veins in the eastern part of Eveslogchorr Mountain of the Khibiny Mountains. Vop. geol. i min. Kol'. poluos. no.1:165-180 '58. (MIRA 11:10)
(Eveslogchorr Mountain--Mineralogy)

GALAKHOV, A.V.

Conference on prospects for the utilization of mineral raw materials and the development of the mining of metals in the Murmansk Economic and Administrative Region. Izv.Kar. i Kol'.fil.AN SSSR no.3:182-183 '58. (MIRA 11:12)
(Murmansk Province--Mines and mineral resources)

IVANOVA, T.N.; GALAKHOV, A.V.

"Lovozero alkaline massif" by K.A.Vlasov, M.V.Kuz'menko, E.M.Es'kova. Izv.AN SSSR.Ser.geol. no.3:115-116 Mr '61. (MIRA 15:2)
(Lovozero Tundras—Rocks, Igneous) (VLasov, K.A.)
(Kuz'menko, M.V.) (Es'kova, E.M.)

GALAKHOV, A.V.

Characteristics of the composition of rock-forming nepheline in the Khibiny alkali massif. Mat. po min. Kol'. poluost.3: 107-125 '62. (MIRA 17:3)

GALAKHOV, A.V.

Boris Mikhailovich [illegible]pletskii, 1894-1965; obituary. Sov. geol. 8 no.6:173-174 Je '65. (MIRA 18:8)

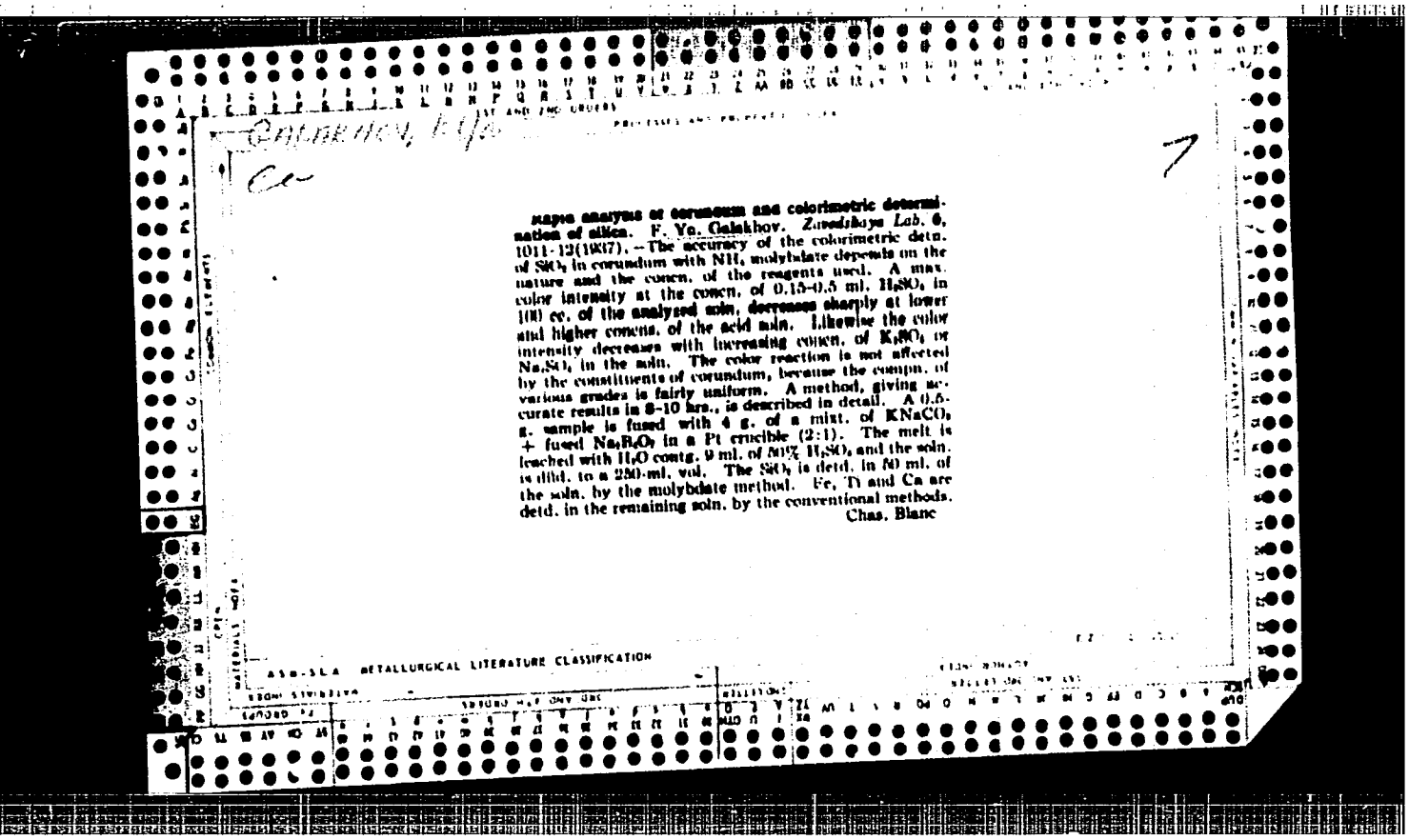
GALAKHOV, Boris Sergeyevich; ZELENKO, G.A., red.; SHADRINA, N.D., tekhn.red.

[Along victory road] Dorogoi pobed. Izd-vo VTsSPS Profizdat, 1959. 38 p. (MIRA 12:4)

1. Predsedatel' zavkoma profsoyuza zavoda "Elektrosila" imeni S.M.Kirova (for Galakhov).
(Efficiency, Industrial)

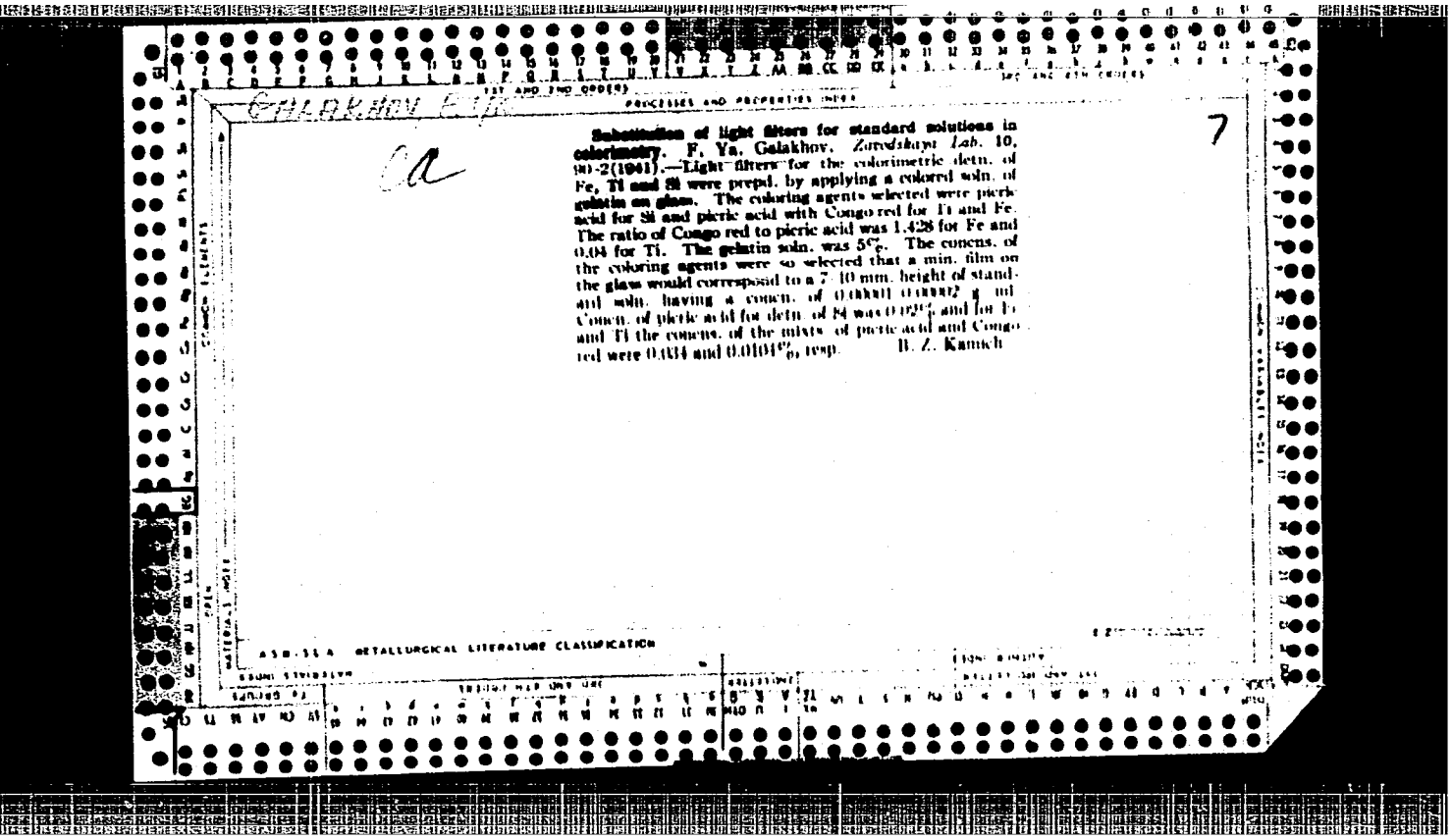
GALAKHOV, F. V.

Galakhov, F. V. and Katkaev, V. A. "On the Method of Magnetic Prospecting in the Region of Gornaya Shoriia." Vestnik Zapadno-Sibirskogo Gidro-Geologicheskogo Tresta, Tomsk, No. 1, 1935, pp. 61-63.



rapid analysis of corundum and colorimetric determination of silica. F. Ye. Galakhov. *Zavodskaya Lab.* 6, 1011-13(1937).—The accuracy of the colorimetric detn. of SiO_2 in corundum with NH_4 molybdate depends on the nature and the concn. of the reagents used. A max. color intensity at the concn. of 0.15–0.5 ml. H_2SO_4 in 100 cc. of the analyzed soln. decreases sharply at lower and higher concns. of the acid soln. Likewise the color intensity decreases with increasing concn. of K_2SO_4 or Na_2SO_4 in the soln. The color reaction is not affected by the constituents of corundum, because the compn. of various grades is fairly uniform. A method, giving accurate results in 8–10 hrs., is described in detail. A 0.5-g. sample is fused with 4 g. of a mixt. of $KNaCO_3$ + fused $Na_2B_4O_7$ in a Pt crucible (2:1). The melt is leached with H_2O contg. 9 ml. of 50% H_2SO_4 and the soln. is dild. to a 250-ml. vol. The SiO_2 is detd. in 50 ml. of the soln. by the molybdate method. Fe, Ti and Ca are detd. in the remaining soln. by the conventional methods.

Chas. Blanc



GALAKHOV, F.Ya.

7

Substitution of light filters for standard solutions in colorimetry. F. Ya. Galakhov. *Zavodskaya Lab.* 10, 90-2(1941).—Light filters for the colorimetric detn. of Fe, Ti and Si were prepd. by applying a colored soln. of gelatin on glass. The coloring agents selected were picric acid for Si and picric acid with Congo red for Ti and Fe. The ratio of Congo red to picric acid was 1.428 for Fe and 0.04 for Ti. The gelatin soln. was 5%. The concns. of the coloring agents were so selected that a min. film on the glass would correspond to a 7–10 mm. height of standard soln. having a concn. of 0.0001–0.00002 g. ml. Concn. of picric acid for detn. of Si was 0.02%; and for Fe and Ti the concns. of the mixts. of picric acid and Congo red were 0.034 and 0.0001%, resp. B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GALAKHOV, F.Ya.

3

The system alumina-silica. N. A. Toropov and F. Ya. Galakhov. *Doklady Akad. Nauk S.S.S.R.* 78, [illegible]. Thermal analysis of 3 samples of the Al_2O_3-SiO_2 system, (1) the initial sample upon fusion in an elec. arc, (2) upon heating at 1890° for 13 min. in a W jacket, and (3) heated under the same conditions but not completely covered, showed that the SiO_2 evapd. completely. Sample 2 was composed only of mullite, whereas sample 3 clearly shows a layer of corundum on the surface where the SiO_2 has evapd. I. Rovtar Leach

TOROPOV, N. A., GALAKHOV, F. YA.

Totopov, N. A.

"New data on the system AL_2O_3-SiO_2. N. A. Toropov. F. Ya. Galakhov. Reviewed by Prof. S. V. Glebov. Ogneupory 17, No. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1952 1953, Uncl.

CA

State diagram of the system barium oxide–alumina. N. A. Toropov and F. Ya. Galakhov. *Doklady Akad. Nauk S.S.S.R.* 82, 69–70 (1952).—The complete m. diagram was detd. with samples contg. no $BaCO_3$. The system has 4 eutectic points (compns. in wt. %): 1000°, BaO 85, Al_2O_3 15%; 1710°, 77.5, 22.5; 1790°, 45, 55; 1880°, 17, 83. There are 3 maxima, corresponding to the compds.: $3BaO.Al_2O_3$ m. 1780°; $BaO.Al_2O_3$ m. 1830°; $BaO.6Al_2O_3$ m. 1900°. N. Thon

Insitut Khimii Silikatov Akademii nauk SSSR.

GALAKHOV, F. YA.

USSR.

15

The mullite problem. N. A. Toropov and F. Ya. Galakhov. *Voprosy Petrog. i Mineral., Akad. Nauk S.S.S.R.* 2, 245-55(1953); cf. Belyankin and Lapin, *C.A.* 45, 5897a.—A vacuum microfurnace is described, for temps. up to 3000°, with a W coil as the heating element, and for cylindrical samples of about 3–4 mm. in diam. and height. The temps. were measured by an optical pyrometer, and the vacuum was brought to 10^{-3} mm. Hg. The formation of thin layers of W metal deposited on the surface of the samples was important because it impeded the volatilization of SiO_2 from the mixes of SiO_2 and Al_2O_3. Reasons are discussed for the inadequacy of the quenching methods for the investigation of the high-melting mixes of this system. In the expts. of Bowen and Greig (*C.A.* 18, 2587), who described the fusion of mullite as an incongruent phenomenon, with corundum as the primary crystal phase, a volatilization of SiO_2 from the pellets of the mixes was not considered. The volatilization of SiO_2 into the atm. of the Ir furnace caused considerable changes in the compn. of the mixes, and the apparently incongruent fusion reaction only occurred by the relative enrichment in Al_2O_3 in the samples. These effects were reproduced; SiO_2 volatilization was controlled by chem. analyses. A revised phase-equil. diagram is given for the system Al_2O_3–SiO_2, in which mullite has a congruent fusion point of about 1890°, and a eutectic point mullite + corundum + melt is fired at about 1850° and 78% Al_2O_3.

(illegible)

In the phase-equil. diagrams of the ternary systems CaO–Al_2O_3–SiO_2 and MgO–Al_2O_3–SiO_2 corresponding phase-boundary curves between the fields of primary mullite and corundum are proposed. The congruent fusion of mullite is also in agreement with the production of monocrystals of mullite in a Frémy-Verneuil flame fusion process (cf. Bauer, *et al.*, *C.A.* 44, 5557b), and the industrial experience of manufg. electrocast mullite glass-tank blocks. The complications of the process, which were caused by the assumption of an indispensable quenching of the melts from 1930° to 1810° (cf. Litvakovskii and Osipov, *Elektroplavlennye Vysokoglinozemistye Ogneupory dlya Steklodelya*, Moscow, 1950), are unnecessary. The volatilization of SiO_2 from mullite refractory bodies above 1700° was also observed in industrial furnaces, indicated by the formation of a turbid corundum-enriched surface layer.

W. Eitel

GALAKHOV, F. YA.

(3)

1493. Phase diagram of the ternary system $BaO-Al_2O_3-SiO_2$.—N. A. Toropov, F. Ya. Galakhov, and I. A. Bondar (*C.R. Acad. Sci. U.R.S.S.*, 89, 89, 1953).

GALAKhov, F. YA.

USSR.

Diagram of state for the ternary system $BaO-Al_2O_3-SiO_2$. N. A. Toropov, F. Ya. Galakhov, and I. A. Bondar. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1954, 753-64.—The system consisted of 13 fields of stability for the various phases. A ternary solid soln. is formed with $2BaO.SiO_2$, $BaO.2SiO_2$, and $BaO.Al_2O_3.2SiO_2$. A new aluminosilicate was found, having the compn. $3BaO.3Al_2O_3.2SiO_2$, which, upon fusion, decomp. J. Reytar Leach

GALAKHOV, F. Ya.

USSR/ Chemistry - Silicates

Card 1/1 Pub. 40 - 1/27

Authors : Toropov, N. A.; Galakhov, F. Ya.; and Bondar', I. A.

Title : Solid solutions formed by celsian, dibarium trisilicate and barium disilicate (Sanbornite)

Periodical : Izv. AN SSSR. Otd. khim. nauk 1, 3-8, Jan-Feb 1955

Abstract : Experiments were conducted to establish the zone, boundaries and liquidus of a ternary solid solution formed by barium disilicate, dibarium trisilicate and celsian. It was found that the refraction index for this zone depends largely upon the barium disilicate and aluminum oxide contents of the solution. The refraction index decreases with the increase of barium disilicate and Al_2O_3. The equilibrium ratio of the investigated solution was established on the basis of several polythermal samples with constant Al_2O_3 contents. Two USA references (1922 and 1950). Graphs; table; illustrations.

Institution : Acad. of Sc., USSR, Institute of Chem. of Silicates

Submitted : January 28, 1954

GALAKHOV, F. Ya.

"Tempering Micro-Furnace with Temperatures to 2,500 Degrees of Centrigrade" lecture given at the International Metallurgists' Conference, Moscow 26-30 June 56

Source 3,302,240, 11 Jan 57.

GALAKHOV, F. YA.

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 368

Author: Toporov, N. A., and Galakhov, F. Ya.

Institution: Academy of Sciences USSR

Title: Liquation in the System ZrO_2-SiO_2

Original Periodical: Izv. AN SSSR, section on chemical sciences, 1956, No 2, 158-161

Abstract: The ZrO_2-SiO_2 system has been investigated over the temperature range 1,800 to 2,500°. The experiments were carried out with an argon atmosphere in the microfurnace described earlier (F. Ya. Galakhov, Zavod. laboratoriya, 1951, No 2, 254). On the curve connecting the melting points no maximum could be found for the compound $ZrSiO_4$. It was established that $ZrSiO_4$ melts by decomposing into ZrO_2 and liquid. At high temperatures liquation can be observed in the system. The liquation region covers the concentration range 41-62 weight percent SiO_2, starting at 2,250°, and shows a critical point

Card 1/2

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 368

Abstract: at 53% SiO_2 and 2,430°. A phase diagram has been drawn for the high-temperature region of the investigated system.

Card 2/2

GALAKHOV F. Ya.

Category: USSR / Physical Chemistry
Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical analysis. Phase transitions. B-8

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29943

Author : Toropov N. A., Galakhov F. Ya., Bondar' I. A.
Inst : Academy of Sciences USSR
Title : Diagram of State of the Ternary System CaO - BaO - SiO_2.

Orig Pub: Izv. AN SSSR, Otd. khim. n., 1956, No 6, 641-648

Abstract: A study of the liquidus diagram of the system CaO (I) - BaO (II) - SiO_2 (III). Synthesis of initial specimens and the furnaces utilized have been described previously (RZhKhim, 1955, 37847). As starting materials were used 99.90% SiO_2, 98.80% $BaCO_3$, 99.88% $CaCO_3$. Phase equilibria were investigated by the methods of hardening, crystal growing, microscopically and by x-ray phase analysis. Liquidus of the system is represented by 12 fields of crystallization of different phases; composition and temperatures of invariant points are given. It was found that stratification region,

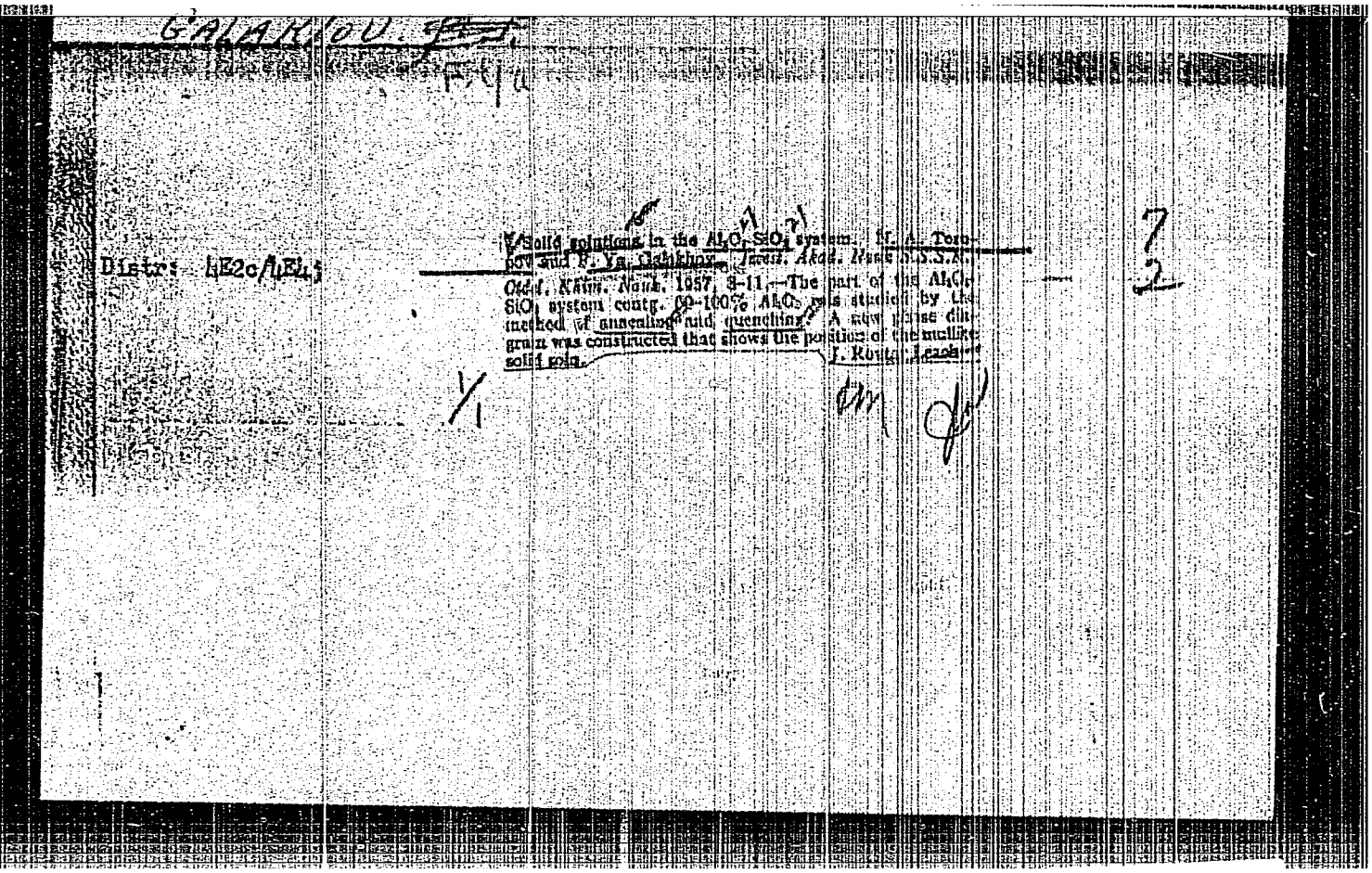
Card : 1/2

Category: USSR / Physical Chemistry
Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical analysis. Phase transitions. B-8

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29943

of the I-III system, which encompasses concentrations from 72 to 99.5% III, as was shown before (Ol'shanskiy Ya. I., Dokl. AN SSSR, 1951, 76, No 1, 93), in the ternary system extends up to 11% II. Boundaries of stratification region have been determined as well as the temperatures of co-existence of crystalline phase III and two liquid layers. Coordinates of critical point of ternary system: 5% I, 11% II and 1690°.

Card : 2/2



GRANKOU. F.S.

Distr: 4E2c/4E4j

Solid solutions in the Al_2O_3-SiO_2 system. M. A. Toropov and F. Ya. Galakhov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk*, 1957, 8-11.—The part of the Al_2O_3-SiO_2 system contg. 50–100% Al_2O_3 is studied by the method of annealing and quenching. A new phase diagram was constructed that shows the position of the mullite solid soln.

J. Rovtop Leeds

Galakhov, F. Ya.

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3806.

Author : F. Ya. Galakhov.
Inst : Academy of Sciences of USSR.
Title : Investigation of Alumina Region of Ternary Aluminosilicate Systems. Report 1. FeO-Al 0 -SiO and MnO-Al 0 -SiO Systems.

Orig Pub: Izv. AN SSSR. Otd. khim. n., 1957, No 5, 525-531.

Abstract: The alumina regions of FeO (I) - Al_2O_3 (II) - SiO_2 (III) and MnO (IV) - II - III systems were studied by the method of annealing and tempering in Ar atmosphere and by following microscopic investigation of polished thin sections and immersed preparations. The position of the eutectic point was checked and the borders of mullite and corundum were drawn. The previously known graph of the binary system I - II was corrected; it was found that hercynite ($FeO.Al_2O_3$) fuses without dissociation. Numerical ma-

-43-

Card : 1/2

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3806.

terial, state graphs and microphotographs of corundum, mullite and hercynite (melt. p. 1800°) crystals are given.

-44-

Card : 2/2

GALAKHOV, F.Ya.

Studying the aluminous region of ternary aluminosilicate systems. Report No.2: $BeO-Al_2O_3-SiO_2$ systems. Izv. AN SSSR. Otd. khim. nauk no.9:1032-1036 S '57. (MIRA 10:12)

1. Institut khimii silikatov AN SSSR.
(Alumina) (Beryllium oxide) (Silicon oxides)

GALAKHOV, F. Ya. and N. A. TOROPOV

"Solid Solutions in Al_2O_3 - SiO_2 System" p. 505

Transactions of the Fifth Conference on Experimental and Applied Mineralogy and Petrography, Trudy ... Moscow, Izd-vo AN SSSR, 1958, 516pp.

reprints of reports presented at conf. held in Leningrad, 26-31 Mar 1956. The purpose of the conf. was to exchange information and coordinate the activities in the fields of experimental and applied mineralogy and petrography, and to stress the increasing complexity of practical problems.

GALAKHOV F. YA.

AUTHORS: Toropov, N. A., and Galakhov, F. Ya. 62-1-2/29

TITLE: The Solid Solutions in the System Al_2O_3 - SiO_2 (Tverdyye rastvory v sisteme Al_2O_3 - SiO_2)

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1958, Nr 1, pp 8-11 (USSR)

ABSTRACT: The variety of the structure of the crystals of synthetic sillimanite noticed by Rayt (reference 1) was the reason of the new research works of Bowen and Greig (reference 2). The chemical compound (formed by the components of the system) has the new formula 3 Al_2O_3 . 2 SiO_2. In 1951 the authors during the investigation of the socalled three component system detected for the first time BaO-Al_2O_3-SiO_2 the crystallization of the mullite which, however, did not correspond to the diagram of the system Al_2O_3 - SiO_2 (according to Bowen and Greig). In the new variant of the diagram a maximum was established which corresponded to the melting temperature of mullite. Later research works (Budnikov etal. reference 4) confirmed the congruent character of the mullite melt. Later it was found by Posnjak, Greig (reference 6), Rooksby, Partridge (reference 7) by means of the radiographic method that mullite can form solid solutions in alumina. Sheers and

Card 1/2

The Solid Solutions in the System Al_2O_3 - SiO_2 62-1-2/29

Archibald (reference 8) made a correction of the diagram of the system (according to Bowen and Greig, reference 2). (See figures 1 and 2). The given variant, however, gives rise to serious doubts in the correctness of the diagram. It is contradicting to the fact found by the authors that mullite melts without decomposition. Furthermore the above mentioned variant has not yet been checked experimentally (investigation of the crystallization of the corresponding mixtures). In the present paper the authors describe the investigation carried out by them according to the hardening method of part of the system Al_2O_3 - SiO_2 with a high content of alumina (figure 3). According to the obtained results a new diagram was made (see figure 2). Here again the congruent character of the melting of mullite was confirmed. There are 3 figures, 1 table, and 9 references, 4 of which are Slavic.

ASSOCIATION: Institute of Silicate Chemistry, AS USSR (Institut khimii silikatov Akademii nauk SSSR)

SUBMITTED: January 8, 1957
AVAILABLE: Library of Congress

Card 2/2

1. Synthetic sillimanite crystals-Structural analysis
2. Synthetic sillimanite-Chemical analysis

GALAKHOV, F. Ya. Doc Tech Sci -- (diss) "Study of the alumina region of aluminosilicate systems." Len, 1958. 22 pp with diagrams (Acad Sci USSR. Inst of Chemistry of Silicates), 200 copies List of author's works, pp 21-22 (13 titles) (KL, 52-58, 101)

AUTHOR: Galakhov, F. Ya.

62-58-5-1/27

TITLE: Investigation of the Alumina-Region of the Trinary Aluminum Silicate Systems (Izucheniye glinozemistoy oblasti troynykh alyumosilikatnykh sistem) Communication 3: The TiO_2-Al_2O_3-SiO_2-System (Soobshcheniye 3. Sistema TiO_2-Al_2O_3-SiO_2)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, 1958, Nr 5, pp. 529 - 534 (USSR)

ABSTRACT: The structural diagram of the TiO_2-Al_2O_3-SiO_2-system as well as some other diagrams of the trinary aluminum silicate-system remained practically unexplored within the range of the alumina-part. The investigation of this part of the diagram, however, is of greatest importance with respect to the knowledge of the heterogeneous equilibria in the aluminum silicate systems. Erlikh(Reference 1) investigated the Ti - O -system. A series of other works (References 2 to 5) reports on the proof of the TiO, Ti_2O_3, Ti_2O_5-compounds with corresponding description of their properties. Agamavi and Uayt (Reference 7) investigated the TiO_2 - Al_2O_3-SiO_2-system thoroughly (Reference 7). The

Card 1/3

wrong conception on the course of the limit "mullite"-corundum caused that the investigations carried out by Bowen and Greyg (Reference 15) with respect to the determination of corundum and of the invariable point took a negative course. In the present report it is proved that the position of this invariable point deviates substantially from that assumed by Agamavi and Uayt. Furthermore, the author composes in the present report a structural diagram of the alumina-part(range) of the trinary system TiO_2-Al_2O_3-SiO_2. The course taken by the limits between the fields of corundum and "mullite" corresponds to the eutectic point which was found by the author already earlier in the alumina-silica-system. Concluding, the author thanks for the attention paid by and the advice received from the director of the physical-chemical laboratory of the Institute for the Chemistry of Silicates of the AS USSR, N. A. Toropov. There are 4 figures, 1 table and 16 references, 4 of which are Soviet.

Investigation of the Alumina-Region of the Trinary Aluminum Silicate Systems. Communication 3: The TiO_2-Al_2O_3-SiO_2-System

62-58-5-1/27

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute for the Chemistry of Silicates AS USSR)

SUBMITTED: February 8, 1957

1. Aluminum silicates--Analysis 2. Aluminum silicates--Properties

Card 3/3

GALAKHOV, F. YA.

24(8) PHASE I BOOK EXPLOITATION SOV/2117

Soveshchaniye po eksperimental'noy tekhnike i metodam vysokotemperaturnykh issledovaniy, 1956

Eksperimental'naya tekhnika i metody issledovaniy pri vysokikh temperaturakh; trudy soveshchaniya (Experimental Techniques and Methods of Investigation at High Temperatures; Transactions of the Conference on Experimental Techniques and Methods of Investigation at High Temperatures) Moscow, AN SSSR, 1959. 789 p. (Series: Akademiya nauk SSSR. Institut metallurgii. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali) 2,200 copies printed.

Resp. Ed.: A.M. Samarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.L. Bankvitser.

PURPOSE: This book is intended for metallurgists and metallurgical engineers.

COVERAGE: This collection of scientific papers is divided into six parts: 1) thermodynamic activity and kinetics of high-temperature processes 2) constitution diagram studies 3) physical properties of liquid metals and slags 4) new analytical methods and production of pure metals 5) pyrometry, and 6) general questions. For more specific coverage, see Table of Contents.

II. CONSTITUTION DIAGRAM STUDIES

The author bases his method on an overall study of the chemical reactivity of the elements in the periodic table in relation to a given element (in this case, iron), specifically, their ability to form solid solutions with iron. He gives methods for constructing constitution diagrams of multicomponent iron-base alloys (5-8 components).

A range of compositions forming solid solutions when heated was found for the following: 1) ZrO_2-MgO binary mixtures (solid-solution melting points: 2200-2500° C) 2) ZrO_2-MgO-Al_2O_3 ternary mixtures (solid-solution melting points: 2200-2625° C), and 3) MgO-Cr_2O_3-ZrO_2 ternary mixtures (solid-solution melting points: 2200-2600° C). Roentgenometric analysis established the formation of ternary solid solutions of cubic modification in the range of ternary mixtures of the system ZrO_2-MgO-CaO, rich in zirconium--from 80 to 95 mol. percent of ZrO_2. Melting points of these mixtures fall between 2500 and 2660° C. The absence of a eutectic makes these mixtures important refractory materials.

4

5(2)

AUTHOR: Galakhov, F. Ya.

SOV/62-59-4-2/42

TITLE: Study of the Alumina Range of the Ternary Alumino-silicate System (Izucheniye glinozemistoy oblasti troynykh alyumosilikatnykh sistem). Communication 4. The System Li_2O-Al_2O_3-SiO_2 (Soobshcheniye 4. Sistema Li_2O-Al_2O_3-SiO_2)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 575-581 (USSR)

ABSTRACT: The range of the ternary diagram having an alumina content of less than 50 % has been investigated by a number of authors (Refs 4-6). Figure 1 shows a diagram of the ternary system according to the previously published data. The phase diagram of the system Li_2O-Al_2O_3, which forms one of the sides of the triangle Li_2O-Al_2O_3-SiO_2, has not been entirely investigated before. For this reason the melting temperatures and primary phases have been determined in the present work for the section between the point $Li_2O.Al_2O_3$ and 100 % alumina in several compositions of the binary system Li_2O-Al_2O_3. The results are given in a curve (Fig 2). Between $Li_2O.Al_2O_3$ and $Li_2O.5Al_2O_3$

Card 1/4

there is a eutectic system composed of 14 % Li_2O and 86 % Al_2O_3. Its melting point lies at 1760°. Figure 3 shows the range of the ternary diagram in which the compositions and boundary curves investigated have been entered. The experimental results obtained when the samples were hardened are given in table 1. The boundary between the corundum and mullite fields begins at the eutectic point of the binary system alumina-silica, which forms one side of the triangle, and extends almost parallel thereto. In the binary system lithium oxide-alumina 0.5 % Li_2O is sufficient to cause the separation of a certain amount of γ-alumina. In the ternary system a small amount of lithium oxide appears also to cause the crystallization of γ-alumina. Owing to a very small width of the corundum field it has not been possible to find the boundary between this field and the γ-alumina field. The boundary between the mullite field and the solid solution of the β-eucriptite $Li_2O.Al_2O_3.2SiO_2$ has been found as far as to the composition containing approximately 55 % silica. The boundary is very

close to the connecting line alumina-lithium aluminate but does not cross it. This is in agreement with the results found by other authors. The boundary between the γ-alumina and lithium aluminate fields begins at the eutectic point of the binary system $Li_2O.Al_2O_3$-Al_2O_3 and crosses the connecting line silica-lithium aluminate twice. In the lithium aluminate field the crystals of the primary phase have variable refractive indices. The refractive indices of this phase are given in table 2. In view of the results obtained in the determination of the boundary between γ-alumina and lithium aluminate solid solutions a part of the liquidus curve of the pseudobinary system SiO_2-$Li_2O.Al_2O_3$ has been plotted. On this curve the crystallization field $Li_2O.Al_2O_3$ is shown, which supplements the diagram of this system prepared by Hatch (Ref 3). Figure 5 shows the diagram of this system including the results obtained in this work on the section from 100 % to 60 % $Li_2O.Al_2O_3$. In the phase diagram of the ternary system (Fig 6) the results obtained in this work and those found before were combined.

Study of the Alumina Range of the Ternary Alumino- SOV/62-59-4-2/42
silicate System. Communication 4. The System Li_2O-Al_2O_3-SiO_2

There are three invariant peritectic points in the region investigated. The compositions and melting temperatures of these points are given in table 3. The ternary system Li_2O-Al_2O_3-SiO_2 differs from other ternary aluminosilicate systems by the peculiar location of the corundum field. It has been stated that the main crystal phase of the lithium-containing products having a high alumina content must be γ-alumina rather than corundum. The author appreciates the interest shown by N. A. Toropov. There are 6 figures, 3 tables, and 10 references, 2 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 23, 1957

Card 4/4

5 (2)

AUTHOR: Galakhov, F. Ya. SOV/62-59-5-2/40

TITLE: Investigation of the Alumina Region of Ternary Aluminum Silicate Systems (Izucheniye glinozemistoy oblasti troynykh alyumosilikatnykh sistem). Communication 5. The Systems $Na_2O-Al_2O_3-SiO_2$ and $K_2O-Al_2O_3-SiO_2$ (Soobshcheniye 5. Sistemy $Na_2O-Al_2O_3-SiO_2$ i $K_2O-Al_2O_3-SiO_2$)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 770 - 773 (USSR)

ABSTRACT: First of all a short report on the state of investigation of the systems (I), (II) mentioned in the title (Refs 1-21) is given and it is stated that the region with high Al_2O_3 content of this system and the system $K_2O-Al_2O_3$ (II) have not yet been investigated. The investigation methods applied were described in a previous work on the system $Li_2O-Al_2O_3-SiO_2$ (Ref 23). In this work the boundaries between the fields of mullite and corundum were found. Table 1 shows the results of the annealing of the samples. The phase diagram of the ternary system (I)

Card 1/2

Investigation of the Alumina Region of Ternary Aluminum Silicate Systems. Communication 5. The Systems $Na_2O-Al_2O_3-SiO_2$ and $K_2O-Al_2O_3-SiO_2$ SOV/62-59-5-2/40

was plotted from all data given supplemented by data from this work (Fig 1). Table 2 shows the results of the annealing of samples of system (II). The limits of this system were found between the mullite field and the fields of corundum and the compounds $K_2O.11Al_2O_3$ (Fig 2). The exact situation of the limit between the corundum and $K_2O.11Al_2O_3$ field could not be established. The direction of the limits found agrees with the eutectic points which had been found previously in the system $Al_2O_3-SiO_2$. The author thanks N. A. Toropov for his advice and the help rendered with the work. There are 2 figures, 2 tables, and 23 references, 6 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 23, 1957

Card 2/2

22512

S/062/61/000/004/001/008
B118/B208

15.2100 1142, 1273, 1145

AUTHORS: Toropov, N. A., Galakhov, F. Ya., and Konovalova, S. F.

TITLE: Silicates of rare earth elements. 2. Phase diagram of the binary system gadolinium oxide - silicon dioxide

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, no. 4, 1961, 539-543

TEXT: The lanthanum silicate $2La_2O_3 \cdot 3SiO_2$ was synthesized and described for the first time by N. A. Toropov and I. A. Bondar' (Izv. AN SSSR, Otd. khim. n., 1959, 552), and its melting range in the system La_2O_3-SiO_2 was determined. The structure of gadolinium oxide described by C. E. Curtis, I. R. Johnson was not confirmed by these scientists. The purpose of the present work was therefore the study of the system Gd_2O_3-SiO_2. The authors proceeded from a 98.2% gadolinium oxide containing 1.75% of other rare earths, and powdery rock crystal (99.90% SiO_2). The study was performed in different ways by an annealing and hardening method. The phases

Card 1/7

Silicates of rare earth...

were determined by X-ray analysis. The resultant phase diagram of the system Gd_2O_3-SiO_2 is shown in Fig. 1. The following three compounds were detected in this system: $Gd_2O_3 \cdot SiO_2$, $2Gd_2O_3 \cdot 3SiO_2$, and $Gd_2O_3 \cdot 2SiO_2$. The liquidus curve has two peaks corresponding to the melting of the compounds $Gd_2O_3 \cdot SiO_2$ and $2Gd_2O_3 \cdot 3SiO_2$, and three eutectics. The liquidus curve is drawn on the basis of the experimental annealing and hardening results. The melting point of gadolinium oxide Gd_2O_3 obtained by the authors is lower by about 150°C than that found by C. E. Curtis and I. R. Johnson. The roentgenograms of the authors agreed with those obtained by these workers. The compound $Gd_2O_3 \cdot SiO_2$ melts without decomposition at 1900°C. The roentgenograms as well as the optical data indicate the formation of the same compound. The compound $2Gd_2O_3 \cdot 3SiO_2$ is stable only in the range between 1630 and 1950°C; at 1950°C it melts without decomposition. Below 1630°C it is split into two other compounds, i.e., $Gd_2O \cdot SiO_2$ and $Gd_2O_3 \cdot 2SiO_2$. The compound $Gd_2O_3 \cdot 2SiO_2$ melts at 1720°C and decomposes to

give $2Gd_2O_3 \cdot 3SiO_2$ and a liquid. Table 3 presents formulas and temperatures of the invariant points of the system Gd_2O_3-SiO_2. The oxy-orthosilicates $Gd_2O(SiO_4)$, the orthosilicates $Gd_4(SiO_4)_3$, and the pyrosilicates $Gd_2Si_2O_7$ have been synthesized and described. The authors determined the ranges of separation into layers and the respective upper-limit critical point. Fig. 2 shows roentgenograms of the compounds. There are 5 figures, 3 tables, and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The three references to English-language publications read as follows: F. P. Glasser, I. Warshaw, R. Roy, Amer.Ceram.Soc.Bull.38,169(1959); I. Warshaw, R. Roy, Amer.Ceram.Soc.Bull.38,169(1959); C. E. Curtis, I. R. Johnson, I.Amer.Ceram.Soc.40,15(1957).

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences USSR)

SUBMITTED: January 18, 1960

26399
S/062/61/000/008/001/010
B117/B206

15.2230

AUTHORS: Toropov, N. A., Galakhov, F. Ya., and Konovalova, S. F.

TITLE: Silicates of rare earths. Communication 5. Phase diagrams of the systems Dy_2O_3-SiO_2 and Er_2O_3-SiO_2

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniya khimicheskikh nauk, no. 8, 1961, 1365-1371

TEXT: The authors investigated the binary systems Dy_2O_3-SiO_2 and Er_2O_3-SiO_2 according to the method explained in previous studies by N. A. Toropov et al. (Ref. 2: Izv. AN SSSR, Otd. khim. n., 1961, 539; Refs. 1, 3, 4: Izv. AN SSSR, Otd. khim. n., 1960, 153; Izv. AN SSSR, Otd. khim. n., 1961, 544; Izv. AN SSSR, Otd. khim. n., 1961, 739). The specimens were prepared from dysprosium oxide with a content of oxides of other rare earths of less than 0.6 %, from erbium oxide (99.11 %) with 0.85 % admixtures and from rock crystal powder (99.90 % SiO_2). Dysprosium oxide annealed at 1000°C has a cubical structure, refractive index of n=1.88 and melting point of 2210°C. After being alloyed in the electric

Card 1/8

Silicates of rare earths...

arc, it disintegrates into powder even at very fast cooling. After this treatment, however, the specimen contains a certain amount of a high-temperature variety. This could be ascertained when comparing the roentgenograms of a specimen annealed at 1000°C and one alloyed in the arc, as well as microscopically. The mean refractive index of the high-temperature phase is n=1.975. On the basis of experiments, dysprosium oxide must be classified as belonging to the group of polymorphous oxides of rare earths. This corresponds to the latest data by M. W. Shafer and R. Roy (Ref. 6: J. Amer. Ceram. Soc. 42, N 11 (1959)). Erbium oxide differs from dysprosium oxide by the fact that it does not disintegrate after being alloyed in the arc. The optical properties and roentgenograms of Er_2O_3 annealed at 1000°C and of that alloyed in the arc are identical. Presumably, Er_2O_3 only exists in cubical form in the temperature range of from 1000°C up to the melt. The refractive index is n=1.95, the melting point 2290°C. The phase diagram of the system $Dy_2O_3 \cdot SiO_2$ (Fig. 2) drawn up on the basis of the experimental annealing- and hardening results shows the existence of three compounds: $Dy_2O_3 \cdot SiO_2$, $2Dy_2O_3 \cdot 3SiO_2$ and $Dy_2O_3 \cdot 2SiO_2$. Compounds of similar compositions were also found in the system $Er_2O_3 \cdot SiO_2$

Silicates of rare earths...

(Fig. 3). The optical properties and density of the compounds produced are contained in Table 3 and the calculated interplanar spaces in Table 4. The oxy-orthosilicates $Dy_2O[SiO_4]$ and $Er_2O[SiO_4]$ as well as the orthosilicates $Dy_4[SiO_4]_3$ and $Er_4[SiO_4]_3$ melt without decomposition. However, the latter two are only stable in a specific temperature range. Below this range, they decompose into oxy-orthosilicates and pyrosilicates. During melting, dysprosium pyrosilicate $Dy_2[Si_2O_7]$ decomposes into orthosilicate $Dy_4[SiO_4]_3$ and liquid. A great change of the properties of silicates of rare earths was first determined in erbium pyrosilicate $Er_2[Si_2O_7]$: in contrast to silicates with a lower ordinal number (Y, La, Sm, Gd, Dy), it melts without decomposition and has a corresponding maximum on the phase diagram of Er_2O_3-SiO_2. Moreover, it differs from other pyrosilicates by a much higher double refraction. Composition and temperature of the eutectics between oxy-ortho- and orthosilicates of both systems and the eutectic between ortho- and pyrosilicates of the Er_2O_3-SiO_2 system could not be exactly ascertained, and are therefore marked on the phase diagrams

Card 3/8

Silicates of rare earths...

by dashed lines. Microscopic and roentgenographic investigations showed that the products, the composition of which lies between the silicates mentioned, consist of two corresponding phases. In these cases the course of the liquidus curve was determined from observing simultaneous meltings of two specimens in the microfurnace. The compositions of such pairs of specimens show differences of 1-2 %. Unmixing of the melts takes place in both systems. The upper critical point in the unmixing range lies at 2320°C in the system with dysprosium; composition 28 % Dy_2O_3 and 72 % SiO_2. In the system Er_2O_3-SiO_2 the critical point lies at 2280°C; composition 30 % Er_2O_3 and 70 % SiO_2. There are 4 figures, 6 tables, and 6 references: 4 Soviet and 2 non-Soviet-bloc. The references to English-language publications read as follows: C. E. Curtis, J. R. Johnson, J. Amer. Ceram. Soc. 40, N 1, (1957); M. W. Shafer, R. Roy. J. Amer. Ceram. Soc. 42, N 11 (1959).

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry AS USSR)

SUBMITTED: October 17, 1960

Card 4/8

GALAKHOV, F Ya

5

CERAMICS, EUROPEAN ASSOCIATION OF - Eighth International Ceramic Congress - Copenhagen, Denmark, 21-25 May 62

BUDNIKOV, Petr P., Corresponding Member of the Academy of Sciences USSR. Professor and Head, Chair of General Silicate Technology, Moscow Chemical Technology Institute imeni D. I. Mendeleyev - "Mullite-carborundum and corundum-carborundum refractories resistant to spalling" (Section II)

TORPOV, Nikita A., BONDAR, I. A., and GALAKHOV, F. Ya., Institute of Chemistry of Silicates, Academy of Sciences USSR- "Solid high temperature silicate solutions of rare earth elements" (Section I)

TOMANEK, Vladimir, Dipl. Ing., Dr., Prague- "New criteria for the evaluation of refractory clay and slate" (Section II)

BR

35586
S/062/62/000/003/001/014
B110/B101

5.2300

AUTHORS: Bondar', I. A., Galakhov, F. Ya., and Toropov, N. A.

TITLE: Silicates of rare-earth elements. Communication 7: Solid solutions between the silicates of lanthanum and samarium, gadolinium and dysprosium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 3, 1962, 377-382

TEXT: The interaction of rare-earth silicates was studied on binary systems of oxyortho-, ortho- and diorthosilicates of La and Sm (subgroup I) and Gd and Dy (subgroup II):

$$La_2O_3 \cdot 2SiO_2 - Sm_2O_3 \cdot 2SiO_2;\ Gd_2O_3 \cdot 2SiO_2 - Dy_2O_3 \cdot 2SiO_2$$
$$2La_2O_3 \cdot 3SiO_2 - 2Sm_2O_3 \cdot 3SiO_2;\ 2Gd_2O_3 \cdot 2SiO_2 - 2Dy_2O_3 \cdot 3SiO_2$$
$$La_2O_3 \cdot SiO_2 - Sm_2O_3 \cdot SiO_2;\ Gd_2O_3 \cdot SiO_2 - Dy_2O_3 \cdot SiO_2$$

The mixtures of pure (~98.2-99.9 %) oxides of La, Gd and Si (crystallized silica) were tempered at 2000-1500°C in a microvacuum- and platinum rhodium furnace (40 % Rh). In binary systems of monotypic compounds of the

Card 1/4

silicates of La and Sm, Gd and Dy, continuous series of solid solutions are formed, as their composition and structure are similar and the ionic radii lie close together (La = 1.22 Å, Sm = 1.13 Å, -Gd = 1.11 Å, Dy = 1.07 Å). The following systems are typical: (1) diorthosilicates: $La_2O_3 \cdot 2SiO_2$-$Sm_2O_3 \cdot 2SiO_2$, (2) orthosilicates: $2Gd_2O_3 \cdot 3SiO_2$-$2Dy_2O_3 \cdot 3SiO_2$ and (3) oxyorthosilicates: $La_2O_3 \cdot SiO_2$-$Sm_2O_3 \cdot SiO_2$. As these systems, with regard to the character of the change of liquidus and solidus curves, belong to the first type of solid solutions by Roozeboom, no decomposition of the solid solutions occurs at a temperature decrease to 1500°C. For isovalent isomorphism, in particular, a regularity between the phase diagrams and the difference of the cationic radii was determined. Up to 15 % difference, the phase diagrams belong to the first type by Roozeboom (La-Sm silicates: ~8 %, Gd-Dy silicates: ~4 % difference). As the diorthosilicates La, Sm, Gd, Dy ($La_2O_3 \cdot 2SiO_2$) decompose, during melting, into orthosilicates ($2La_2O_3 \cdot 3SiO_2$) and glass, a straight line in the phase diagrams separates the crystallization fields of the compounds 2:3 and 1:2. Monophase, granular or polygonal structures were microscopically determined

in every system in the crystallized compositions for any component ratio. Single phase structure of solid solutions was observed only under near-equilibrium conditions (crystallizing from melts and longer heating). Insufficient heating and great temperature interval between liquidus and solidus produces disequilibrium crystallization of the solid solutions. As the diffusion processes are not terminated here, an inhomogeneous structure is formed (zonal structure). Longer tempering compensates the component concentration and causes granular structure. In all systems from oxy- and diorthosilicates the crystals are biaxial and optically positive, in the systems from orthosilicates they are monoaxial, optically negative and of hexagonal syngony. The optical refraction is for $Sm_2Si_2O_7$: $n_g = 1.775$, $n_p = 1.765$, for $La_2Si_2O_7$: $n_g = 1.762$, $n_p = 1.752$. Similarity of the monotypic silicates and continuous change of the interfacial spacings was established for all systems by X-ray phase analysis. The X-ray pictures of the systems $Sm_2O_3 \cdot 2SiO_2$-$La_2O_3 \cdot 2SiO_2$ and $2Gd_2O_3 \cdot 3SiO_2$-$2Dy_2O_3$-$3SiO_2$ confirmed the formation of homogeneous ranges. When substituting $La_2O_3 \cdot 2SiO_2$ by various amounts of $Sm_2O_3 \cdot 2SiO_2$, or

Silicates of rare-earth elements...

$2Gd_2O_3 \cdot 3SiO_2$ by $2Dy_2O_3 \cdot 3SiO_2$, the diffraction maxima are displaced in the direction of the small values of d. There are 6 figures and 2 tables.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences USSR)

SUBMITTED: October 4, 1961

Card 4/4

S/062/62/000/005/001/008
B110/B101

AUTHORS: Toropov, N. A., Galakhov, F. Ya., and Konovalova, S. F.

TITLE: Silicates of rare-earth elements. 9. Solid solutions between yttrium and erbium silicates

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1962, 738-743

TEXT: The systems $Y_2O_3 \cdot SiO_2$ - $Er_2O_3 \cdot SiO_2$; $2Y_2O_3 \cdot 3SiO_2$ - $2Er_2O_3 \cdot 3SiO_2$, and $Y_2O_3 \cdot 2SiO_2$ - $Er_2O_3 \cdot 2SiO_2$ were investigated. The samples were produced from the respective oxides in accordance with I. A. Bondar' (Izv. AN SSSR, Otd. khim. n. 1962, 377; ibid., 1962, 383), heated in a platinum furnace and a vacuum microfurnace, and examined by microscope and X-ray analysis. Results: (1) The phase diagrams of diortho- and orthosilicates of yttrium and erbium are similar, and large zones of solid solutions are formed in both. (2) The interruption of reciprocal solubility is a small section in the middle of a few tenths percent. According to Rozebom, they belong to the 5th type of diagrams with solid

Card 1/3

solutions. (3) There is a small field of primary crystallization of yttrium orthosilicate due to fusion of yttrium diorthosilicate during decomposition. The roentgenograms showed: (a) Pure yttrium silicates and their solid solutions with 40% erbium silicate display monotype roentgenograms. (b) If erbium silicate $\geq$60%, solid solutions form on the base of it. (c) Samples with equal silicate content (50%) yield a mixture of two solid solutions. (4) There is no interruption of solubility in oxyorthosilicates ($Y_2O_3 \cdot SiO_2$-$Er_2O_3 \cdot SiO_2$). The liquidus curve of the continuous series of solid solutions has a minimum shifted toward erbium oxyorthosilicate (3rd Rozebom type). As the two elements belong to different structural sub-groups, the formation of a continuous solid solution can be explained by the low packing density of the structural elements. However, as in diortho and orthosilicate systems, the minimum also points to a tendency toward interrupting solubility. Different silicate types of the same (yttrium and erbium) rare-earth elements form diagrams of different types of solid solutions among one another. The slight difference (1.9%) of the ionic radii of yttrium and erbium, on the one hand, favors the formation of continuous solid

solutions, but the structural difference of yttrium and erbium silicates, on the other, is an obstacle to it. As a result, different types of silicates of the sumerare-earth elements form either continuous or limited solid solutions among one another. There are 4 figures and 3 tables.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR
(Institute of Silicate Chemistry of the Academy of Sciences USSR)

SUBMITTED: October 31, 1961

GALAKHOV, F.Ya.

Submicroliquation zones on phase diagrars of silicate systems.
Izv. AN SSSR. Otd.khim.nauk no.5:743-748 My '62. (MIRA 15:6)

1. Insitiut khimii silikatov AN SSSR.
(Glass research) (Silicates) (Phase rule and equilibrium)

GALAKHOV, F.Ya.

Phase diagrams and their application to the study of the structure of glass. Stek. i ker. 19 no.7:5-8 Jl '62. (MIRA 15:7)
(Glass)

BONDAR', I.A.; GALAKHOV, F.Ya.; TOROPOV, N.A.

Rare earth silicates. Report No.7: Solid solutions between lanthanium and samarium silicates and gadolinium and dysprosium silicates. Izv.AN SSSR.Otd.khim.nauk no.3:377-382 Mr '62. (MIRA 15:3)

1. Institut khimii silikatov AN SSSR.
(Rare earth silicates) (Solutions, Solid)

BR

ACCESSION NR: AT4019280 S/0000/63/003/001/0038/0038

AUTHOR: Galakhov, F. Ya.

TITLE: Relationship between the phase diagram of silicate systems and the structure and crystallizability of glass

SOURCE: Simpozium po stekloobraznomu sostoyaniyu. Leningrad, 1962. Stekloobraznoye sostoyaniye, vy*p. 1: Katalizirovannaya kristallizatsiya stekla (Vitreous state, no. 1: Catalyzing crystallization of glass). Trudy* simpoziuma, v. 3, no. 1. Moscow, Izd-vo AN SSSR, 1963, 38

TOPIC TAGS: silicate, glass, glass crystallization, sodium borosilicate, phase diagram, glass structure

ABSTRACT: The author's investigations of various systems have shown that a uniform, highly dispersed crystallization is observed in glass, the composition of which lies either close to the region of liquation or in the areas of the phase diagram characterized by a tendency to liquation. One of the conditions for obtaining a perfect glassy-crystalline material is the formation of submicroliquation in the initial glass, which determines its regular fine crystallization. Therefore, it is necessary to establish the areas of metastable liquation experimentally by electron microscopy and small-angle x-ray investigation. For sodium

Card 1/2

ACCESSION NR: AT4019280

borosilicate glass, a close relationship is observed between the structures found experimentally and the state of the mixtures according to the phase diagrams. The Na borosilicates have a strong tendency to liquation. The same is valid for other systems, such as the Li_2O-SiO_2 system. Special investigations to establish the boundaries of submicroliquation on phase diagrams will result in the production of new types of glassy-crystalline and glassy-porous materials. Orig.art.has:no graphics.

ASSOCIATION: none

SUBMITTED: 17May63 DATE ACQ: 21Nov63 ENCL: 00

SUB CODE: MT NO REF SOV: 001 OTHER: 002

Card 2/2

GALAKHOV, F. Ya.

"Microliquation of two-component silicate melts."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

PORAY-KOSHITS, Ye. A. and GALAKHOV, F. Ya.

"Theory of formation and structure of sitalls and crystallizations of glasses."

(Institute of Silicate Chemistry, Academy of Sciences USSR)

At the Division of Physical Chemistry and Technology of Inorganic Materials, Acad. Sci. USSR, a scientific council on the problem of sitalls has been established. The Council is coordinating body for basic scientific research on sitalls, glass, fiber glass, stoneware, refractory and superrefractory materials, and coatings. The purpose of the Council is primarily to contribute to the improvement of the strength and impact resistance of existing materials. In 1963, the council held two sessions.

(Steklo i keramika, no. 6, 1964, 48-49)

ACCESSION NR: AP4042867 S/0062/64/000/007/1158/1164

AUTHOR: Toporov, N. A.; Bondar', I. A.; Galakhov, F. Ya.; Nilogosyan, Kh. S.; Vinogradova, N. V.

TITLE: Phase equilibria in the yttrium oxide-aluminum oxide system.

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 7, 1964, 1158-1164

TOPIC TAGS: yttrium oxide containing system, aluminum oxide containing system, Y sub 2 O sub 3 Al sub 2 O sub 3 system, phase equilibrium, phase diagram, 2Y sub 2 O sub 3 .Al sub 2 O sub 3, 3Y sub 2 O sub 3 .5Al sub 2 O sub 3, Y sub 2 O sub 3, YAlO sub 3, beta alumina type compound, metastable state, K sub 2 O B sub 2 O sub 3 system, potassium oxide containing system, boron oxide containing system, x ray analysis

ABSTRACT: The phase diagram for the Y_2O_3-Al_2O_3 system was constructed (see fig. 1 of the enclosure) based on microstructural and x-ray data. The existence of the three compounds $2Y_2O_3.Al_2O_3$, $3Y_2O_3.5Al_2O_3$ and $Y_2O_3.Al_2O_3$(or $YAlO_3$) was established. Beta-alumina type compounds were not formed. It was indicated a metastable state may be formed in this system between 2:1 and 3:5 with a eutectic at 1850C. A

Card 1/4

ACCESSION NR: AP4042867

partial phase diagram was constructed of the K_2O-B_2O_3 system (see fig. 2 of the enclosure). A metastable region was found in this system between $K_2O.2B_2O_3$ and $K_2O.4B_2O_3$. Orig. art. has: 4 tables and 5 figures.

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenshchikova Akademii nauk SSSR (Institute of Silicate Chemistry, Academy of Sciences SSSR)

SUBMITTED: 03Dec62 ENCL: 02

SUB CODE: IC NO REF SOV: 002 OTHER: 010

Card 2/4

ACCESSION NR: AP4042867

ENCLOSURE: 01

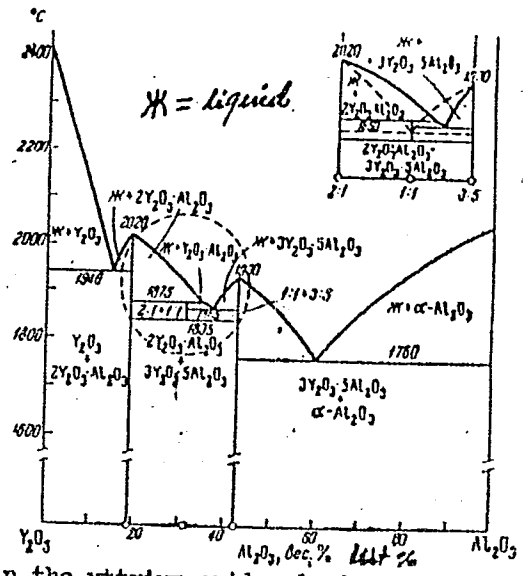


Fig. 1. Phase equilibria in the yttrium oxide-aluminum oxide system.

Card 3/4

ACCESSION NR: AP4042867

ENCLOSURE: 02

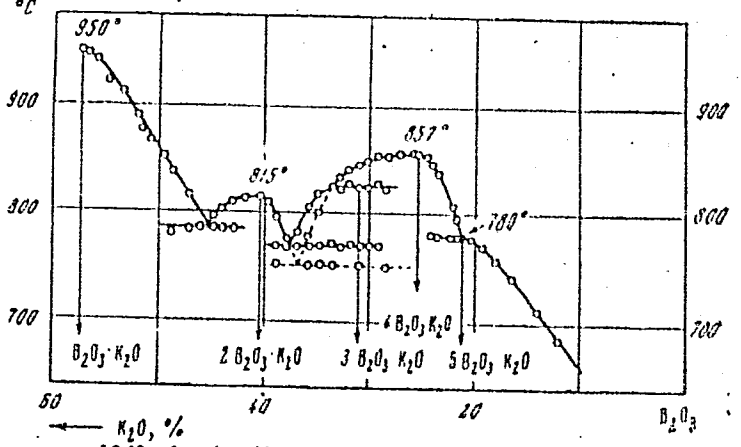


Fig. 2. Phase sequilibria in the potassium oxide-boron oxide system.

Card 4/4

L 10289-65 EWT(m)/EWP(e)/EPA(s)-2/EPF(n)-2/EPA(w)-2/EWP(t)/EWP(b) Pi-4/Pt-10/
Pu-4/Pab-10 IJP(c) RWH/JD/WH
ACCESSION NR: AP4042879 S/0062/64/000/007/1325/1326

AUTHOR: Bondar', I. A.; Galakhov, F. Ya.

TITLE: Phase equilibria in the yttria-alumina-silica system B

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 7, 1964, 1325-1326

TOPIC TAGS: yittrium sesquioxide, aluminum sesquioxide, silicon dioxide, ternary system

ABSTRACT: The phase diagram for the Y_2O_3-Al_2O_3-SiO_2 system was constructed (see Fig. 1 of the Enclosure), and the areas of segregation and the vitreous state were established. There are 11 stable phases: I, area of two glasses; II, cristobalite; III, yttrium diortho (pyro) silicate; IV, orthosilicate; V, oxyorthosilicate; VI, yttrium oxide; VII, yttrium aluminate; VIII, perovskite type compound; IX, garnet type compound; X, corundum; XI, mullite. In the system, there are 8 invariant points of which 2 are eutectic and 6 are reactive. Orig. art. has: 1 figure and 1 table.

Card 1/3

L 18289-65
ACCESSION NR: AP4042879

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenschinkov Akademii nauk SSSR (Institute of Silicate Chemistry, Academy of Sciences SSSR)

SUBMITTED: 18Dec63 ENCL: 01 SUB CODE: IC

NO REF SOV: 002 OTHER: 000

Card 2/3

L 18289-65
ACCESSION NR: AP4042879

ENCLOSURE: 01

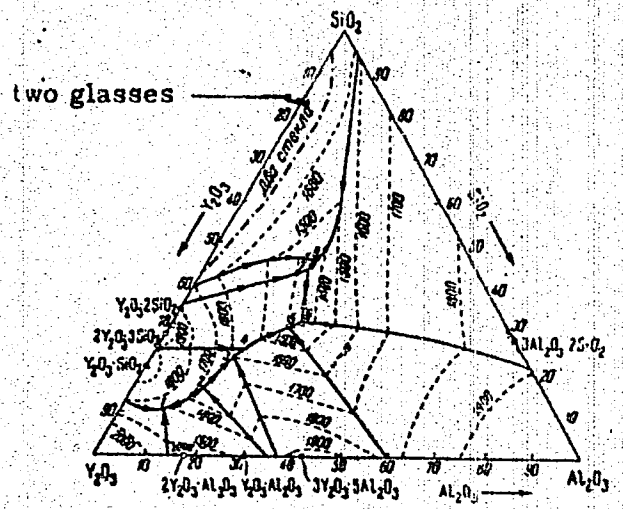


Fig. 1. Phase diagram of the Y_2O_3-Al_2O_3-SiO_2 system with inscribed isotherms.

Card 3/3

L 17850-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(n)-2/EPA(w)-2/T/EPA(bb)-2/EWP(b)
Pab-10/Pq-4/Pt-10/Pu-4 ASD(m)-3 WW/WH
ACCESSION NR: AP4044698 S/0062/64/000/008/1373/1377

AUTHOR: Galakhov, F. Ya.; Konovalova, S. F.

TITLE: Liquation phenomena in the Al_2O_3-SiO_2 system Communication 1. Experimental data and their discussion

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 8, 1964, 1373-1377

TOPIC TAGS: alumina silica system, liquation, heat treatment, microliquation, transparent glass, opalescent glass, porcelain, x ray ionization, microhardness, mechanical strength

ABSTRACT: The unique structures formed by heat treatment in the Al_2O_3-SiO_2 system were apparently caused by microliquation, i.e., the formation of two liquids with very high mutual dispersion. Preliminary work indicated that a transparent glass containing 20-40% alumina became opalescent after heating at 1300C for 1 hour; heating at 1600C gave a porcelain-like material in which the individual crystals were so fine they were not visible. Hence the conditions for

Card 1/3

L 17850-65
ACCESSION NR: AP4044698

3

liquation in the Al_2O_3-SiO_2 system were examined. Compositions containing 15-60 wt. % alumina were heat treated--(1) heated prior to annealing to 150-200 degrees above the annealing temperature, cooled to the holding temperature, then quenched, or (2) heated at 1600C without previous remelting or subsequent quenching. Samples were subjected to microscopic, electron microscope, x ray ionization examinations and microhardness testing. Microliquation was fixed in compositions of 20-60 wt. % Al_2O_3 after samples were annealed at temperatures above the liquidus temperature. It was believed one liquid would crystallize, catalysing crystallization of the less-readily crystallizable liquid, and then the crystallized areas would combine. Their structure and composition was similar, only their particle size differed, causing formation of coarse oval crystallized particles with fine ridges. The microhardness of these oval crystallized particles was much higher than that of the surrounding glass, e.g., 845 vs. 645 kg/mm^2 in a 50-50 Al_2O_3-SiO_2 glass annealed at 1850C for 30 seconds. This increased mechanical strength indicates the possibility of obtaining pyroceramics based on mullite which would probably have greater fire resistance due to the higher fusion temperature of the mullite. Orig. art. has: 1 figure.

Card 2/3

L 17850-65
ACCESSION NR: AP4044698

ASSOCIATION: None

SUBMITTED: 24Dec62 ENCL: 00

SUB CODE: MT NO REF SOV: 000 OTHER: 004

Cord 3/3

L 17851-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(n)-2/EPA(w)-2/EPA(bb)-2/EWP(b) Pab-10/Pq-4/Pt-10/Pu-4 WW/WH

ACCESSION NR: AP4044699 S/0062/64/000/008/1377/1383

AUTHOR: Galakhov, F. Ya. B

TITLE: Liquation phenomena in the Al_2O_3 -SiO_2 system. Communication 2. Microliquation and its representation on the phase diagram of the binary system

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya no. 8, 1964, 1377-1383

TOPIC TAGS: alumina silica system, phase diagram, liquation, microliquation, hypothesis, metastable structure, pyroceramic

ABSTRACT: Based on experimental investigations of the liquation phenomenon in the Al_2O_3-SiO_2 system it was hypothesized that in microliquation there is little difference in the composition of the liquids or glasses coexisting as the metastable state of the melt. As seen from the phase diagram (fig. 1) microliquation occurs in the region encompassing 20-60 wt. % Al_2O_3. The liquidus curve in this range is not horizontal, but inclined. It was suggested that within these limits there is a whole series of individual liquation areas with the pertaining binodal

Card 1/5

curves indicating the compositions of the coexisting liquids (fig. 2). This procedure of constructing partial areas on the phase diagram may be fruitful in the development of the theory of heterogeneous equilibria, but at present the small differences in composition cannot be experimentally proven since there is no way to separate the compositions, and the microliquation structure is metastable (fig. 3). Such phase diagrams may be useful in solving practical problems, such as determining conditions for the production of a pyroceramic: the most suitable temperature range is between the liquidus and the solidus; the glass melt should be held for some time at a temperature only somewhat higher than the liquidus and cooled rapidly to temperatures below the solidus. Final annealing temperature for obtaining a finely crystallized product should be the lowest temperature at which crystallization still proceeds at a sufficient rate. Orig. art. has: 5 figures.

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenshchikova Akademii nauk SSSR (Institute of Silicate Chemistry Academy of Sciences SSSR)

SUBMITTED: 24Dec62 ENCL: 03
SUB CODE: MT NO REF SOV: 005 OTHER: 001

L 17851-65
ACCESSION NR: AP4044699

ENCLOSURE: 01

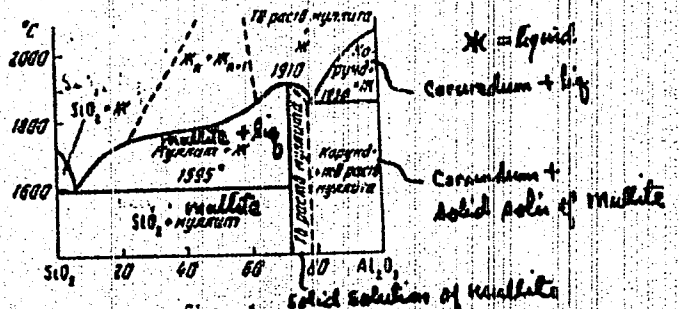


fig. 1

Phase diagram of the Al_2O_3-SiO_2 system with areas indicated in which liquation phenomena (Liq_n + Liq_{n+1}) were observed.

Card 3/5

L 17851-65
ACCESSION NR: AP4044699

ENCLOSURE: 02

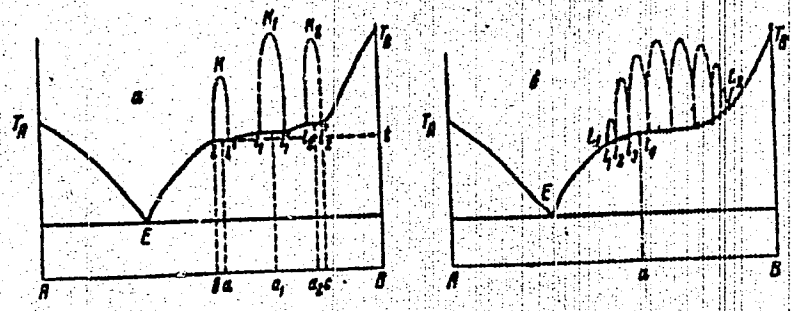


fig. 2

Phase diagrams with microliquation. a--individual "partial" microliquation regions; b--overall location of the "partial" microliquation regions.

Card 4/5

L 17851-65
ACCESSION NR: AP4044699

ENCLOSURE: 03

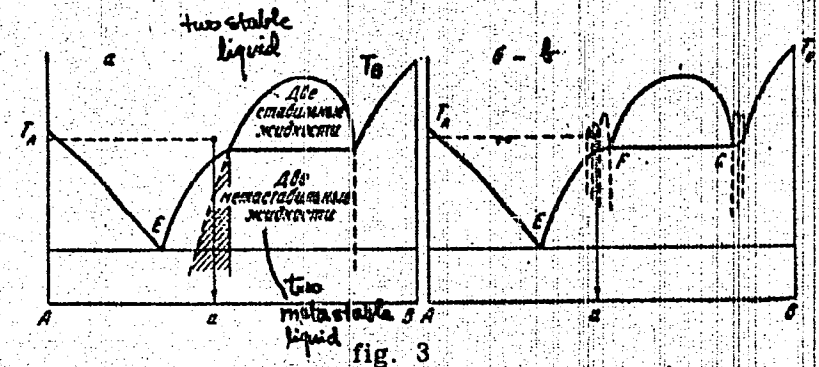


fig. 3

Phase diagrams with the microliquation region, but with different position of the microliquation sections. a--microliquation occurs only below liquidus temperature (cross hatched section); b--microliquation occurs at temperatures above the liquidus

Card 5/5

L 11844-66 EWP(e)/EWT(m)/EWP(b) GS/WH

ACC NR: AT6000476 SOURCE CODE: UR/0000/65/000/000/0113/0114

AUTHOR: Galakhov, F. Ya.

ORG: None

TITLE: Microliquation of two-component silicate melts

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya. Leningrad, Izd-vo Nauka, 1965, 113-114

TOPIC TAGS: calcium oxide, strontium compound, barium oxide, silicate glass

ABSTRACT: Metastable liquation was studied by electron microscopy in the three binary systems $CaO-SiO_2$, $SrO-SiO_2$, and $BaO-SiO_2$. The structure of samples adjacent to the liquation region from the side of the RO component on the phase diagram was compared. It was shown that in all cases of microliquation of silicate melts, the turbidity and opalescence of one of the coexisting glasses is caused primarily by the phenomenon of microliquation. An earlier conclusion that during microliquation the coexisting phases differ little in composition was confirmed. If microliquation develops at below-liquidus temperatures, it is also a metastable liquation; however, it retains all the characteristics which distinguish it from macroliquation. In conclusion, it is emphasized that both macro- and microliquation, whether they develop in a stable or metastable manner, are not directly related to crystallization.

SUB CODE: 11, 07 / SUBM DATE: 22May65 / ORIG REF: 002

Card 1/1 HW

L 12053-66 EWT(1)/EPF(n)-2/ETC(m)

ACC NR: AP6001307 SOURCE CODE: UR/0363/65/001/008/1399/1402

AUTHOR: Galakhov, F. Ya.; Konovalova, S. F.

ORG: Institute of Silicate Chemistry im. I. V. Grebenshchikov, Academy of Sciences SSSR (Institut khimii silikatov Akademiya nauk SSSR)

TITLE: Liquation phenomena in the Li_2O-TiO_2-SiO_2 system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1399-1402

TOPIC TAGS: lithium oxide, titanium oxide, silicon dioxide, phase diagram

ABSTRACT: In order to refine the position of the region of liquation on the phase diagrams of silicate systems, the Li_2O-TiO_2-SiO_2 system was studied as a typical example of a phase diagram in which the regions of macro- and microliquation need to be accurately defined. Samples prepared from Li_2CO_3, TiO_2, and SiO_2 were melted, annealed, and quenched, then their polished sections were examined under the microscope. Marked differences between the structures of the quenched samples made it possible to readily establish the boundary between the regions of macro- and microliquation, and the corresponding refined phase diagram was plotted (see Fig. 1). The region earlier thought to consist of two liquids is actually made up of two portions, and the region of ordinary liquation is bounded by an Li_2O content of 1 — 2% instead of the 20% indicated by the initial diagram. In the light of the establishment of the

Card 1/2 UDC: 541.123.3

L 12053-66

ACC NR: AP6001307

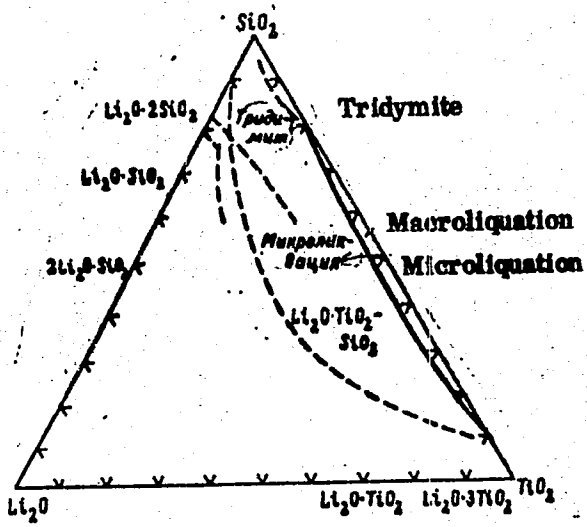


Fig. 1. Phase diagram of the Li_2O-TiO_2-SiO_2 system supplemented with results of present study

fact that microliquation is a special type of liquation phenomena, further development of research on stable and metastable liquation requires some refinements in terminology, which are discussed. Orig. art. has: 2 figures.

SUB CODE: 07, 11 / SUBM DATE: 19Apr65 / ORIG REF: 002 / OTH REF: 005

Card 2/2

GALAKHOV, F.Ya.; KONOVALOVA, S.F.

Liquation phenomena in silicate melts. Dokl. AN SSSR 155 no.1: 122-124 Mr '64. (MIRA 17:4)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR. Predstavleno akademikom N.N.Semenovym.

GALAKHOV, F.Ya.; KONOVALOVA, S.F.

Liquation phenomena in the system Al_2O_3- SiO_3. Report No 1: Experimental data and their discussion. Izv. AN SSSR. Ser. khim. no.8:1373-1377 Ag '64. (MIRA 17:9)

1. Institut khimii silikatov im. I.V. Grebenshchikova AN SSSR.